

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Hidekazu Nishiuchi
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Examiner/Art Unit: N. Bitar/2624
Title: APPARATUS AND METHOD FOR DETECTING OBJECTS

COMMENTS ON STATEMENT OF REASONS FOR ALLOWANCE

M.S. Issue Fee
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

With the Notice of Allowability mailed with the Notice of Allowance dated September 20, 2010, the Examiner states that no other prior art of record teaches or fairly suggests the combination of claimed elements. However, the remaining comments appear directed only to a portion of claim 1 and do not describe the other independent claims. Applicant respectfully submits that each of the independent claims is allowable based only on the combination of features respectively recited therein.

With respect to independent claim 1, the prior art of record fails to teach or suggest an apparatus for detecting a position of an object in one or more images captured by an image pickup device mounted on a vehicle, where the apparatus comprises a memory configured to store a plurality of images captured by the image pickup device, wherein the image pickup device is a single camera, including a first image of an object taken at a first time by the single camera and a second image of the object captured at a second time by the single camera; and a controller operatively coupled to the memory and configured to determine from the first image taken at the first time the position of the object and a first pitch angle of the vehicle relative to a y-coordinate in a horizontal direction is zero, and to determine from the second image whether a second pitch angle of the vehicle relative to the y-coordinate in the horizontal direction at the second time is zero, and to determine the position of the object in the second image based on the position of the object in the first

image if the second pitch angle is not zero.

Dependent claims 2-6 are each allowable for at least this reason.

Independent claim 7 is allowable because the prior art fails to teach or suggest a vehicle comprising an image pickup device mounted on the vehicle to capture a plurality of images of at least one object; a memory on which is stored the plurality of images captured by the image pickup device, wherein the image pickup device is a single camera, including a first image of the at least one object taken by the single camera at a first time when a first pitch angle of the vehicle relative to a y-coordinate in a horizontal direction is zero and an image acceleration is zero and a second image of the at least one object captured by the single camera at a second time; and a controller operatively coupled to the memory and configured to determine a position of the at least one object in the first image and to determine from the first image whether a second pitch angle of the vehicle in the second image at the second time is zero, and to determine a position of the at least one object in the second image based on the position of the at least one object in the first image if the second pitch angle is not zero.

Dependent claims 8-12 are each allowable for at least this reason.

The prior art fails to teach or suggest an apparatus for detecting a position of an object in one or more images captured by a single camera in a vehicle as claimed in independent claim 13, wherein the apparatus comprises image judgment means for determining whether an image of the object captured by the single camera was captured when a pitch angle of the vehicle relative to a y-coordinate in a horizontal direction was zero and an image acceleration was zero; and object position computing means for determining a position of the object in a first image captured by the single camera if the first image was captured when the first pitch angle of the vehicle was not zero, which determination is based on a position in a second image of the same object that was captured by the single camera when a pitch angle of the vehicle was zero and an image acceleration of the second image was zero.

Independent claim 14 is allowable because the prior art fails to teach or suggest a method for detecting a position of an object in an image captured by an image pickup device in a vehicle, the method comprising storing a plurality of images captured by the image pickup device, wherein the image pickup device is a single camera; determining a pitch angle of the vehicle in each of the plurality of images, an image captured by the single camera and having a first pitch angle of zero being a first image; determining a position of

the object in the first image; determining whether a second image of the object captured by the single camera was captured when a second pitch angle of the vehicle relative to a y-coordinate in a horizontal direction was zero; and determining the position of the object in the second image if the second image was captured when the second pitch angle of the vehicle was not zero, which determination is based on the first image of the same object that was captured when the pitch angle of the vehicle was zero.

Dependent claims 15-19 are each allowable for at least this reason.

The Examiner is invited to contact the undersigned at the telephone number listed below if the Examiner has any comments or questions regarding this paper.

Respectfully submitted,

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